Oriental motor

HL-17168-4

EZ limo
easy linear motion

EAS Series Motorized Linear Slides

OPERATING MANUAL

Thank you for purchasing an Oriental Motor product.
This Operating Manual describes product handling procedures and safety precautions.

- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

Table of contents

1 Introduction 2
- 1.1 Introduction 2
- 1.2 Notation on this manual 2
- 1.3 Composition and contents of this operating manual 2
- 1.4 Checking the product 3
- 1.5 How to identify the product model 3
- 1.6 Names and functions of parts 4

2 Installation 6
- 2.1 Location for installation 6
- 2.2 Installation direction 6
- 2.3 Installing the motorized linear slide 6
- 2.4 Changing the motor cable outlet direction 7
- 2.5 Installing a load 10

3 Connection 11
- 3.1 Connecting to the driver 11
- 3.2 Grounding the motorized linear slide 11
- 3.3 Connecting the sensors 11

4 Maintenance 13
- 4.1 Inspection Items and Timing 13
- 4.2 Greasing 15
- 4.3 Adjusting the belt tension and replacing the belt 16
- 4.4 Replacing the motor 18

5 Standard General specifications 20
- 5.1 Standard 20
- 5.2 General specifications 20

6 Before starting operation 21
- 6.1 Operation data setting for the motorized linear slide 21
- 6.2 Moving direction of the table for the motorized linear slide 22
- 6.3 Data setter, data setting software 23
- 6.4 Parameter setting list 24
- 6.5 Power supply current capacity 26

1 Introduction

1.1 Introduction

Only qualified personnel should work with the product. Use the product correctly after thoroughly reading the section "Motorized Actuators BEFORE USING THE PRODUCT." The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

1.2 Notation on this manual

Note	The items under this heading contain important handling instructions that the user should observe to ensure safe use of the product.

1.3 Composition and contents of this operating manual

This is an operating manual of the **EAS** Series motorized linear slides.
Before operating the motorized linear slide, it is necessary to set up the linear slide and driver. Operating manuals supplied with the product vary depending on the type of the product. Read the following operating manuals and follow the instructions.

Type of operating manual	Description	How to obtain the operating manual
EAS Series Motorized Linear Slides OPERATING MANUAL(this document)	This manual explains the installation method of the motorized linear slide and load as well as the maintenance method, and others.	Supplied with the product.
Motorized Actuators BEFORE USING THE PRODUCT	This manual explains safety precautions of the motorized actuator.	Supplied with the product.
Motor OPERATING MANUAL	This manual explains the motor functions and how to install the motor, and others.	Supplied with the product.
Driver OPERATING MANUAL	This manual explains the installation, connection, I/O, safety precautions of the product.	Supplied with the product.
USER MANUAL *	This manual explains the function, installation/ connection method, operating method and others of the driver.	Supplied with the product. (CD-ROM)

* The **EAS** Series has equipped the motor of the **AR** Series and the USER MANUAL of the **AR** Series is also used for the **EAS** Series.

1.4 Checking the product

Verify that the items listed below are included. Report any missing or damaged items to the branch or sales office from which you purchased the product.

When purchasing a motorized linear slide and driver package	When purchasing a motorized linear slide only
• Motorized linear slide • Driver • Surge suppressor ∗1 • Motorized Actuators BEFORE USING THE PRODUCT • Motorized Linear Slides OPERATING MANUAL(this document) • Motor OPERATING MANUAL • Driver OPERATING MANUAL • USER MANUAL (CD-ROM) • Cable for motor ∗3 • Cable for electromagnetic brake(Supplied with an electromagnetic brake motor and driver package) ∗3	• Motorized linear slide • Surge suppressor ∗2 • Motorized Actuators BEFORE USING THE PRODUCT • Motorized Linear Slides OPERATING MANUAL(this document) • Motor OPERATING MANUAL

*1 The surge suppressor comes with the product if the driver which combines the motorized linear slide with an electromagnetic brake is the ARD-K.

*2 The surge suppressor comes with the DC power input type motorized linear slides with an electromagnetic brake.

*3 This does not come with the "products without cables."

1.5 How to identify the product model

■ Motorized linear slides Linear slide and driver package name

Linear slide type					Linear slide specification			Motor type		Driver type		Cable
E	A	S	4	R	X	- D	0	2	5	- A	R	M	K	D	- 3
①			②	③	④	⑤			⑥	⑦	⑧	⑨	⑩		⑪

1	Series name	**EAS**: **EAS** series
2	Linear slide size	**4**: Width 58.4 mm (2.30 in.) Height 60 mm (2.36 in.) **6**: Width 75.4 mm (2.97 in.) Height 83 mm (3.27 in.)
3	Motor mounting direction	**R**: Parallel motor mounting type (right side) **L**: Parallel motor mounting type (left side) Blank: In-line motor mounting type
4	Table	**X**: X-table **Y**: Y-table
5	Ball screw lead	**D**: 12 mm (0.47 in.) **E**: 6 mm (0.24 in.)
6	Stroke	**005** ～ **085**: 50 to 850 mm (1.97 to 33.46 in.)
7	Motor	**AR**: **AR** serise
8	Motor type	**A**: Single shaft **M**: With electromagnetic brake
9	Power input	**K**: 24 VDC/48 VDC **A**: Single-Phase 100 VAC **C**: Single-Phase 200 V **S**: Three-Phase 200 VAC
10	Driver	**D**: Built-in controller type Blank: Pulse input Type
11	Connection cable	Nunber: Length of supplied cable **1**: 1 m (3.3 ft.) **2**: 2 m (6.6 ft.) **3**: 3 m (9.8 ft.) Blank: Without connection cable

■ Motorized linear slides Linear slide name

E A S M 4 R X D 0 2 5 A R M K
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

1	Series name	EASM: EAS series
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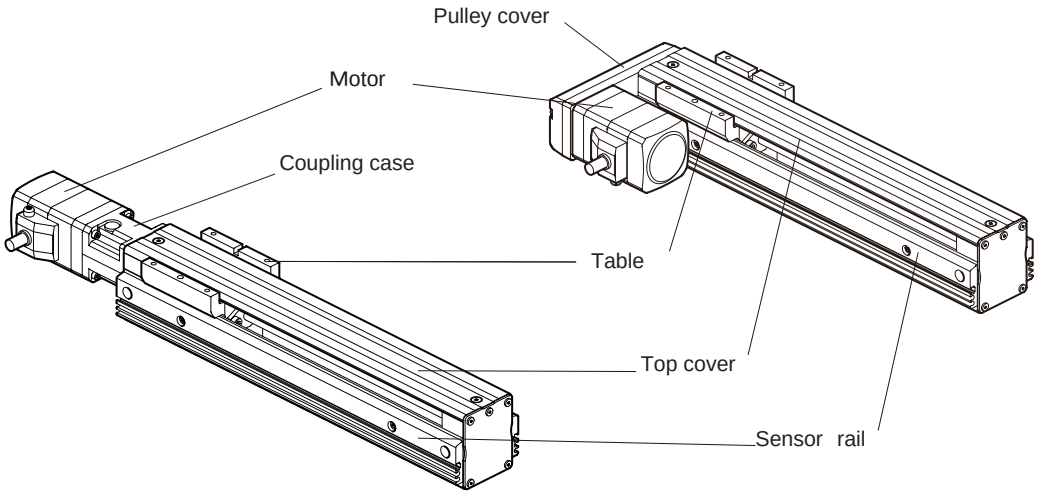
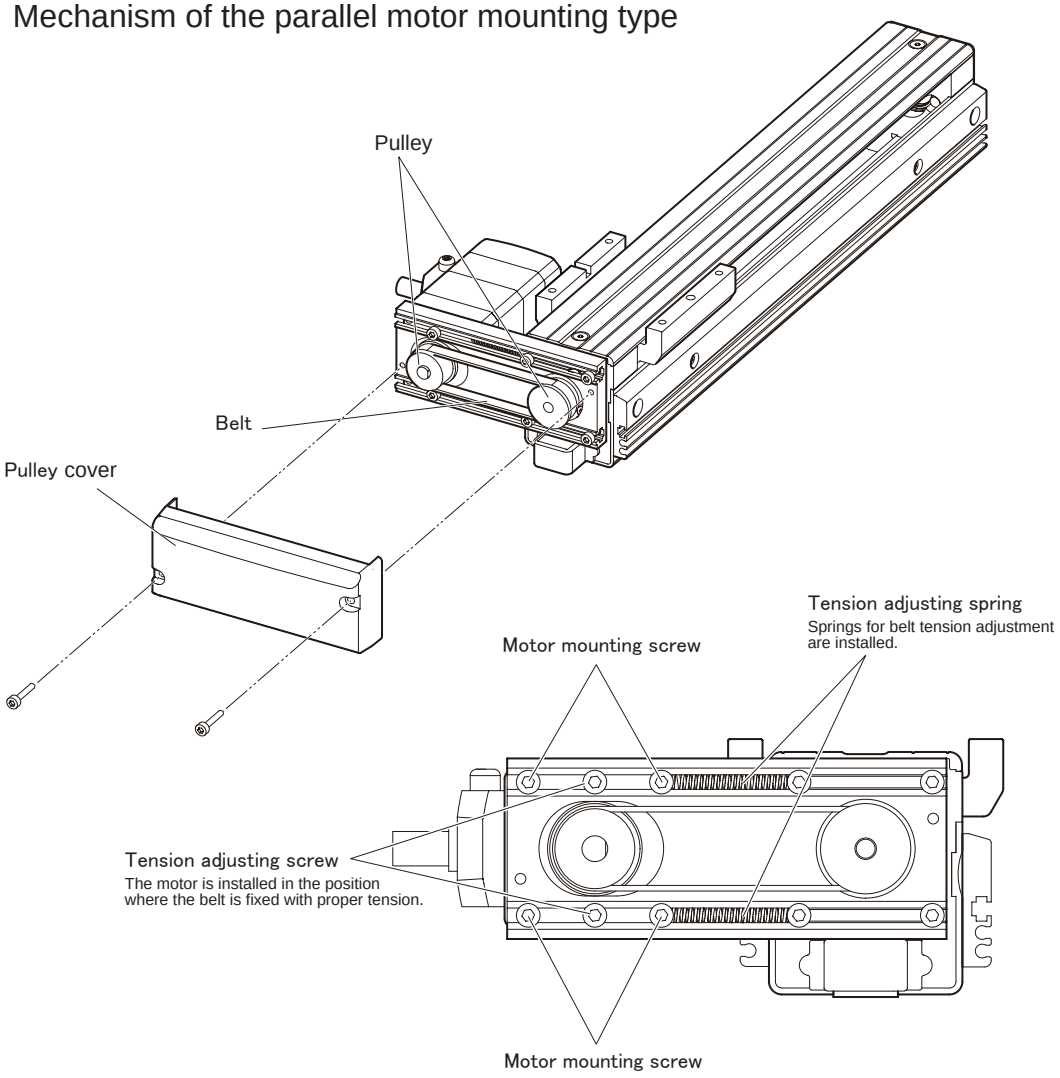
7	Motor	AR: **AR** serise
8	Motor type	A: Single shaft M: With electromagnetic brake
9	Motor power supply type	K: DC power input C: AC power input

1.6 Names and functions of parts

In-line motor mounting type Parallel motor mounting type



Mechanism of the parallel motor mounting type



2 Installation

2.1 Location for installation

The motorized actuator has been designed and manufactured to be incorporated in general industrial equipment. Install them in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions.

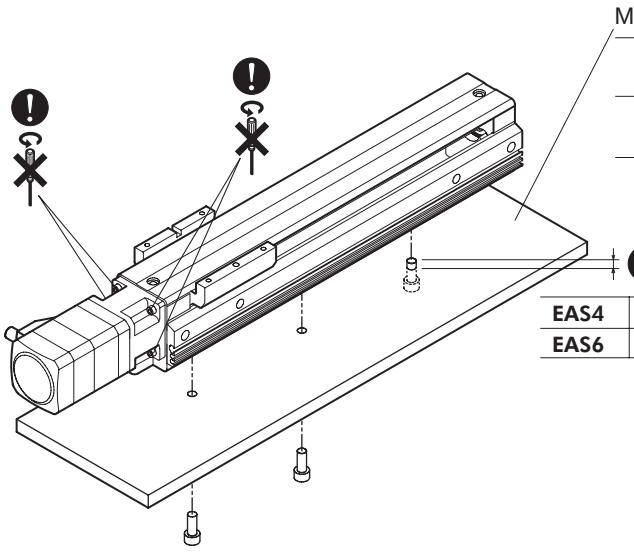
- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature: 0 to +40 ° C (+32 to +104 ° F) (non-freezing)
- Operating ambient humidity 85% or less (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum
- 1000 m (3300 ft.) or lower above sea level

2.2 Installation direction

The motorized linear slide can be installed in any direction.

2.3 Installing the motorized linear slide

To prevent vibration and deflection of the linear slide, install it on a metal surface of sufficient strength.



Thickness	Iron	5 mm (0.20 in.) or more
	Aluminum	10 mm (0.39 in.) or more
Flatness per 200 mm (7.87 in.)	**EAS4**	0.06 mm (0.0023 in.) or less
	EAS6	0.07 mm (0.0027 in.) or less

EAS4	6 mm (0.23 in.) or less
EAS6	8 mm (0.31 in.) or less

	Tightening torque
EAS4	M5 5 N·m (710 oz-in)
EAS6	M6 5 N·m (710 oz-in)

2.4 Changing the motor cable outlet direction

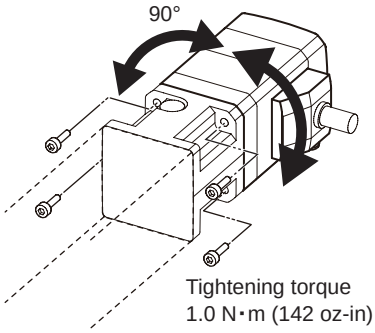
The motor cable outlet direction can be changed according to the equipment.

Note

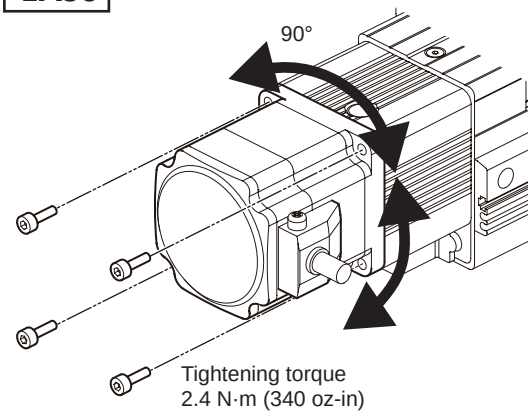
- When changing the motor cable outlet direction, remove the load and keep the motorized linear slide in a horizontal position.
- When the outlet direction has changed, perform return-to-home operation before starting operation.

■ In-line motor mounting type

EAS4

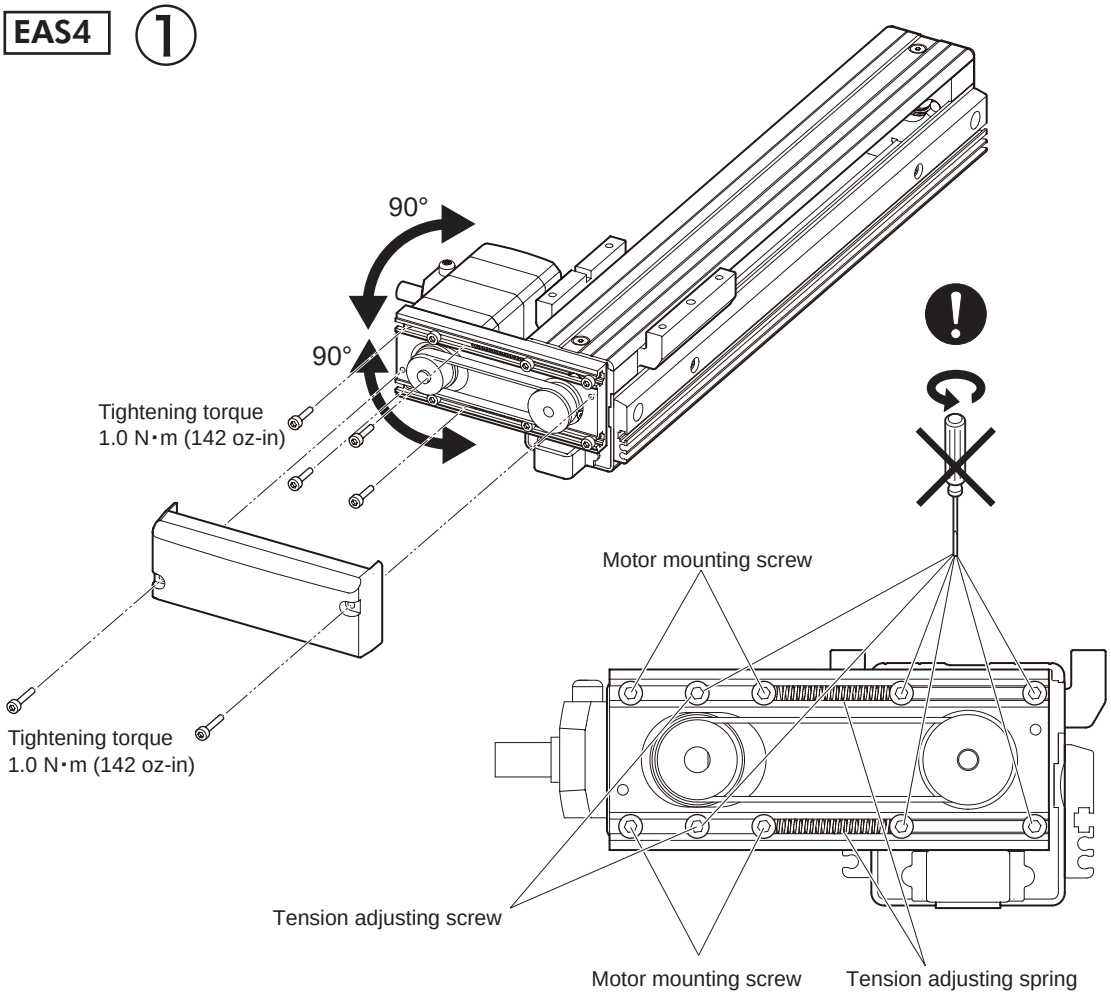


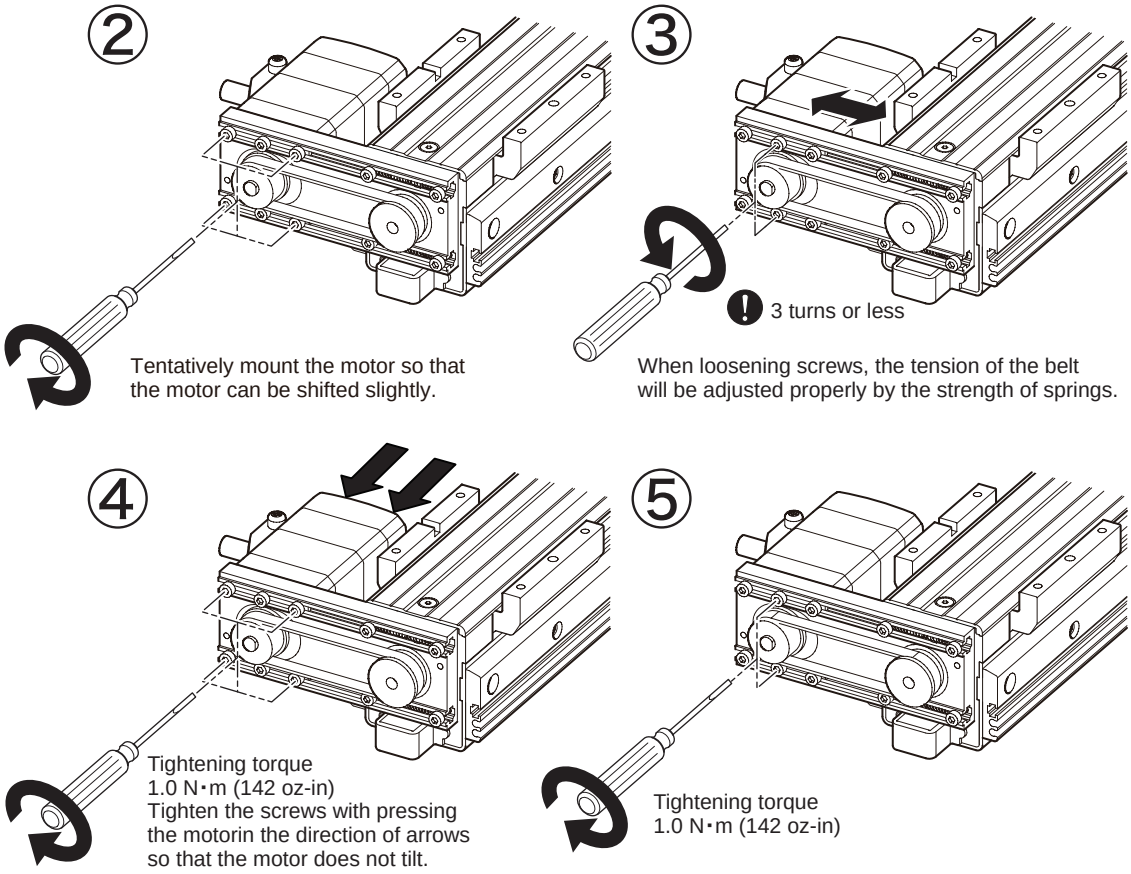
EAS6

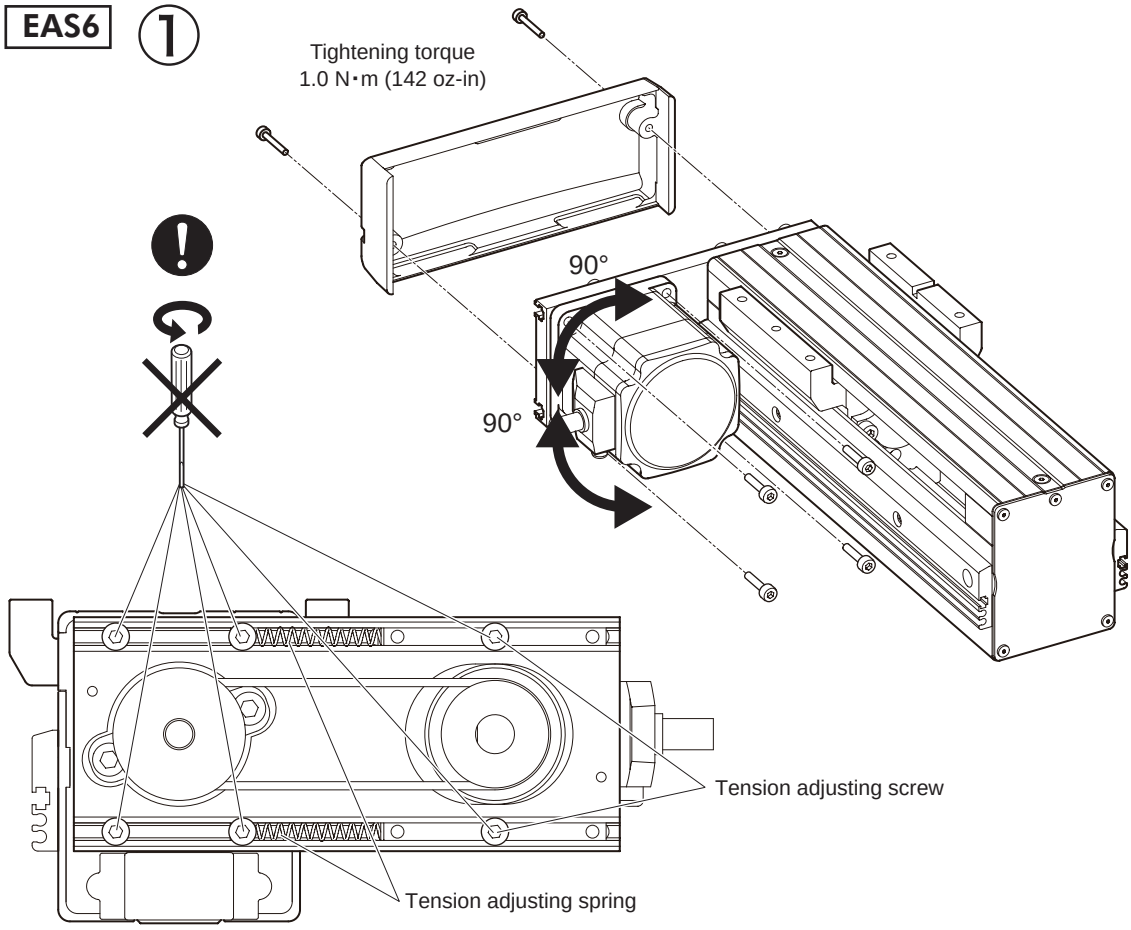


■ Parallel motor mounting type

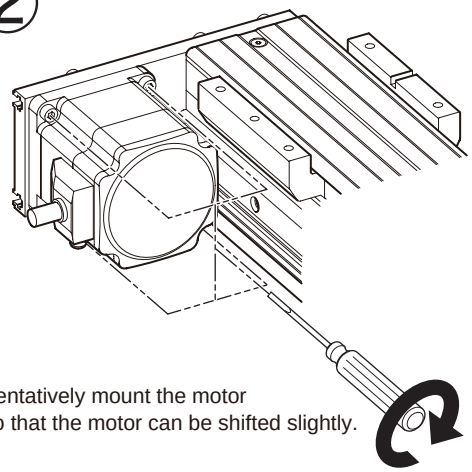
EAS4 ①




②
Tentatively mount the motor so that the motor can be shifted slightly.
③
3 turns or less
When loosening screws, the tension of the belt will be adjusted properly by the strength of springs.
④
Tightening torque
1.0 N･m (142 oz-in)
Tighten the screws with pressing the motorin the direction of arrows so that the motor does not tilt.
⑤
Tightening torque
1.0 N･m (142 oz-in)

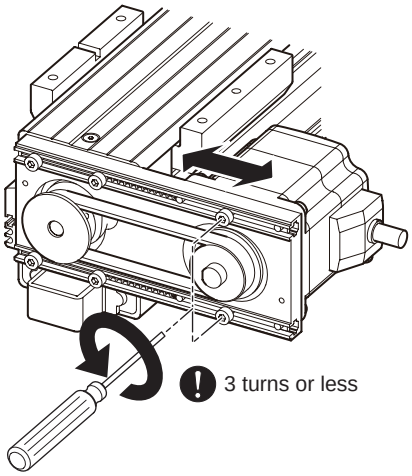

EAS6
①
Tightening torque
1.0 N･m (142 oz-in)
90°
90°
Tension adjusting screw
Tension adjusting spring

②



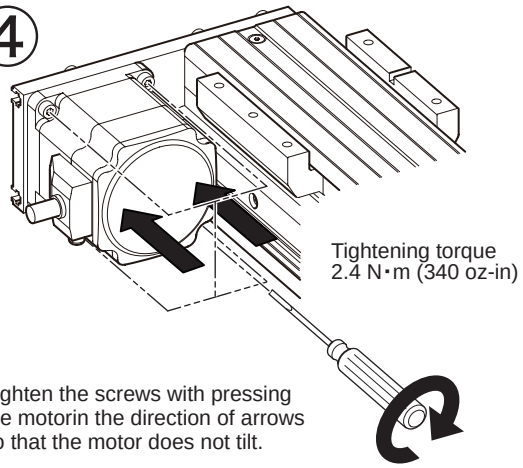
Tentatively mount the motor
so that the motor can be shifted slightly.

③



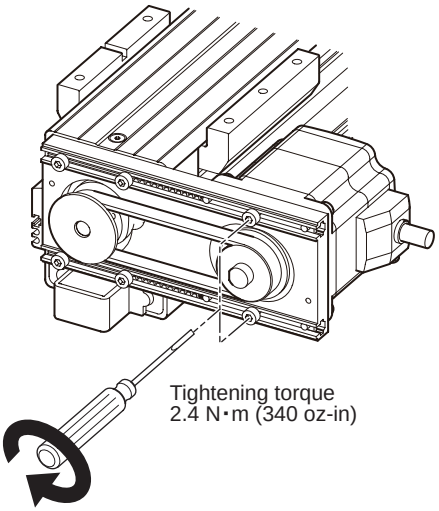
When loosening screws, the tension of the belt
will be adjusted properly by the strength of springs.

④



Tighten the screws with pressing
the motorin the direction of arrows
so that the motor does not tilt.

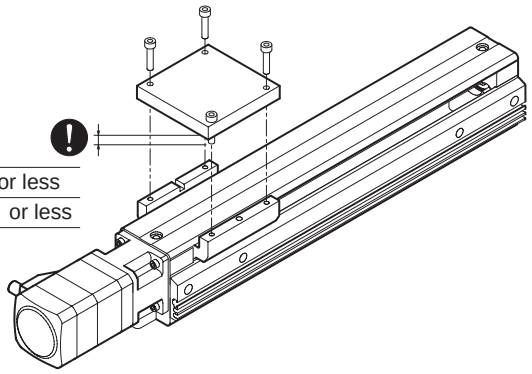
⑤



2.5 Installing a load

Install a load with screws using the load-mounting screw hole in the table.

	Tightening torque
EAS4	M4 2.4 N·m (340 oz-in)
EAS6	M5 5 N·m (710 oz-in)

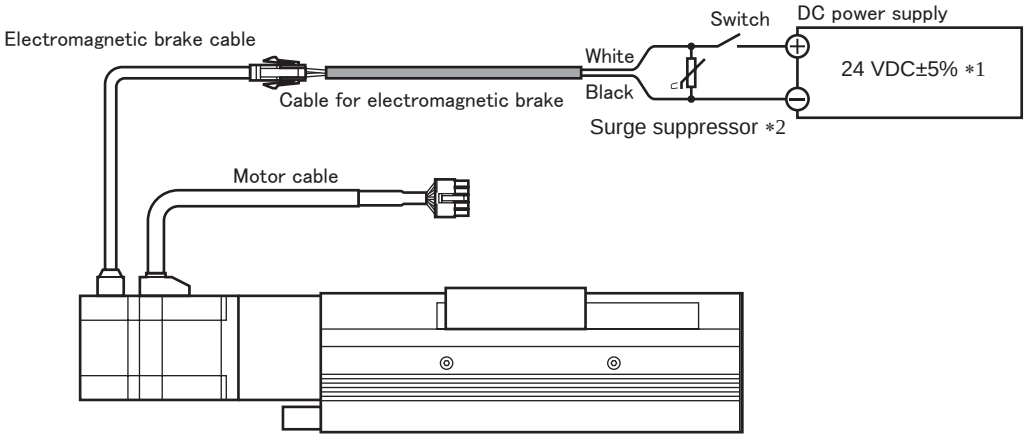


EAS4	8 mm (0.31 in.) or less
EAS6	10 mm (0.39 in.) or less

■ When the electromagnetic brake type is used

When the motorized linear slide with an electromagnetic brake is used, the table cannot move unless the electromagnetic brake is released. To release the electromagnetic brake, a DC power supply is required.

1. Connect the "electromagnetic brake cable" and supplied "cable for electromagnetic brake."
2. Connects the 24 VDC power supply to "cable for electromagnetic brake." Connect the white lead wire to the +24 VDC terminal, and the black lead wire to the GND terminal. When turning on the power, the electromagnetic brake will be released and the table will be able to move by hand.



*1 The current capacity varies depending on the motorized linear slide size and cable length. For details, refer to p.26 "6.5 Power supply current capacity."

*2 The surge suppressor comes with the product if the driver which combines the motorized linear slide with an electromagnetic brake is the ARD-K.

3 Connection

3.1 Connecting to the driver

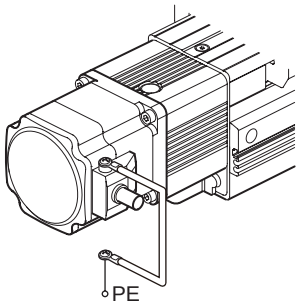
Refer to the Driver OPERATING MANUAL or USER MANUAL for connection method.

3.2 Grounding the motorized linear slide

Be sure to ground the Protective Earth Terminal (screw size: M4) of the linear slide.
(Not required when the power supply of the driver is 24 VDC.)

- Grounding wire: AWG18 (0.75 mm^2) larger
- Tightening torque: 1.2 N·m (170 oz-in)

To ground the linear slide, use a round terminal and secure it with a screw over an inner clip washer. The grounding wire and crimp terminal do not come with the linear slide.



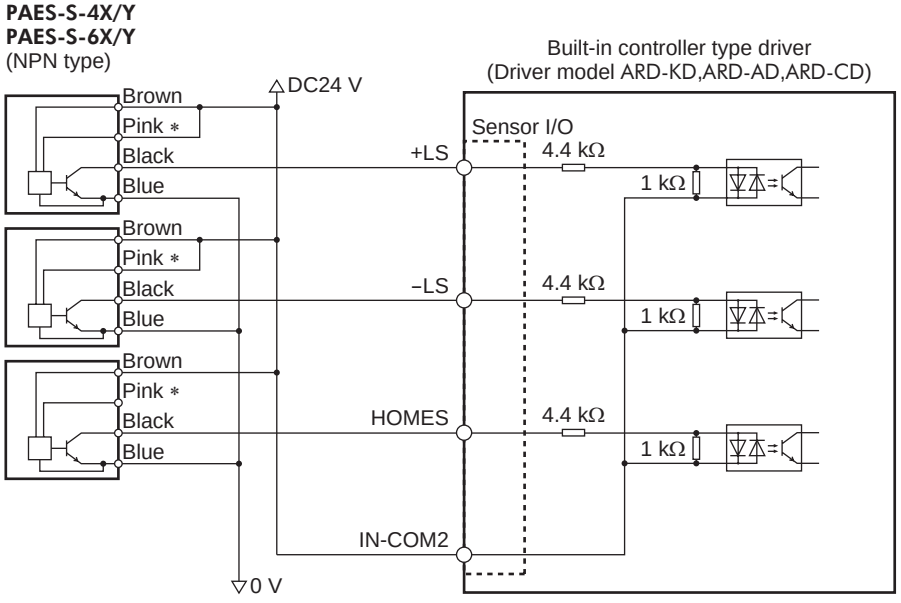
3.3 Connecting the sensors

This section explains examples for how to connect the driver and accessory sensor set. For details, refer to the OPERATING MANUAL for the sensor set or the Driver OPERATING MANUAL.

■ Connection example for the sensor set PAES-S-4X/Y, PAES-S-6X/Y (NPN type)

The connection example is shown based on the following conditions.

- Return-to-home method: 3 sensors
- Logic of +LS output, −LS output: Normally closed
- Logic of HOMES output: Normally open



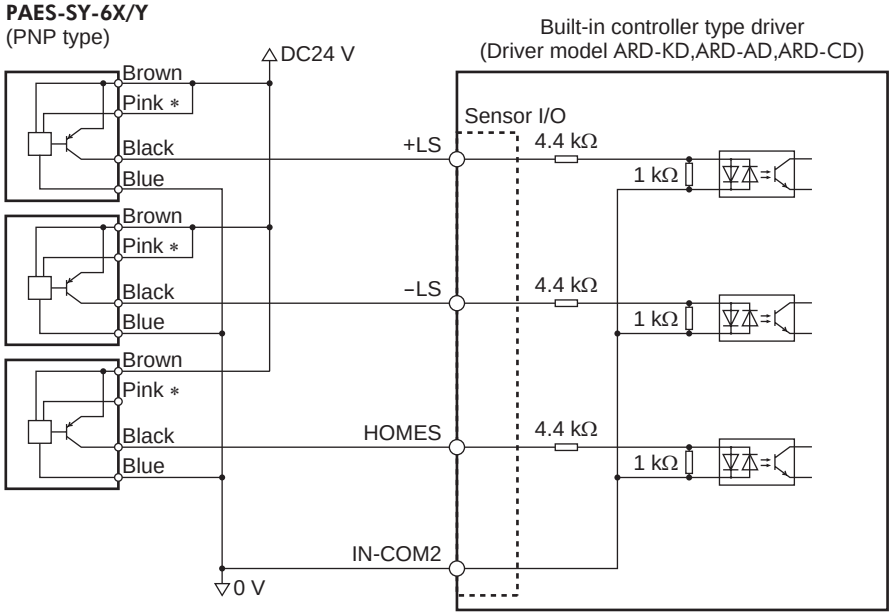
* Normally open or normally closed can be selected by the connection method of the sensor. When selecting normally closed, connect the brown lead and pink lead.

■ Connection example for the sensor set PAES-SY-4X/Y, PAES-SY-6X/Y (PNP type)

The connection example is shown based on the following conditions.

- Return-to-home method: 3 sensors
- Logic of +LS output, −LS output: Normally closed
- Logic of HOMES output: Normally open

PAES-SY-4X/Y
PAES-SY-6X/Y
(PNP type)



* Normally open or normally closed can be selected by the connection method of the sensor. When selecting normally closed, connect the brown lead and pink lead.

4 Maintenance

This chapter explains the maintenance items in order to operate motorized actuators safely and efficiently. If an abnormal condition is noted on the motorized actuator, discontinue any use and contact your nearest Oriental Motor sales office.

4.1 Inspection Items and Timing

Perform maintenance after each applicable period specified in the tables below. The schedule assumes that the motorized linear slide is operated eight hours a day. Shorten the maintenance intervals accordingly if the operation rate is high, such as when the motorized linear slide is operated continuously day and night.

Maintenance time period	External check	Internal check
When operated for the first time	○	–
Six months after initial operation	○	○
Every six months thereafter	○	○

■ External Check

Check the items specified in table below.

Item	What to check	Action if problem is found
Motorized linear slide	• Are there any loose screws which have mounted the motorized linear slide? • Are there any loose screws which have mounted the load? • Are there any loose screws which have mounted the motor?	Tighten the screws securely.
Cables	• Are there any scratches or areas under stress on the cable? • Are there any loose connections on the motor or driver?	Disconnect and reconnect the connector or replace the cable.
Operation	Are there any abnormal noise or vibration from the bearings, etc.?	Check the installation of the load and operating speed again.

■ External Cleaning

- Clean the exterior surface of the motorized linear slide whenever necessary.
- Wipe off any dirt and stains using a soft cloth.
- Do not apply compressed air. Dust may enter through gaps.
- Do not use petroleum solvents, since they will damage the coated surface.
- To remove stubborn stains, wipe the area using a soft cloth moistened with neutral detergent.

■ Internal Check

Visually check the internal condition of the motorized linear slide. Check the items specified in table below. Even if the grease has turned brown, lubrication condition is deemed appropriate if the running surface still appears glossy. Refer to p.15 for how to apply grease.

Item	What to check	Action if problem is found
Ball-screw shaft	Are there any deposits of foreign matter such as dust?	Remove the foreign matter.
	Has the grease lost its gloss or been consumed?	Clean the screw shaft with a soft cloth and apply grease to the nut running groove.
Guide rail	Are there any deposits of foreign matter such as dust?	Remove the foreign matter.
	Has the grease lost its gloss or been consumed?	Use a soft cloth to clean the ball rolling grooves on both sides of the guide rail, and add grease from the grease nipple.

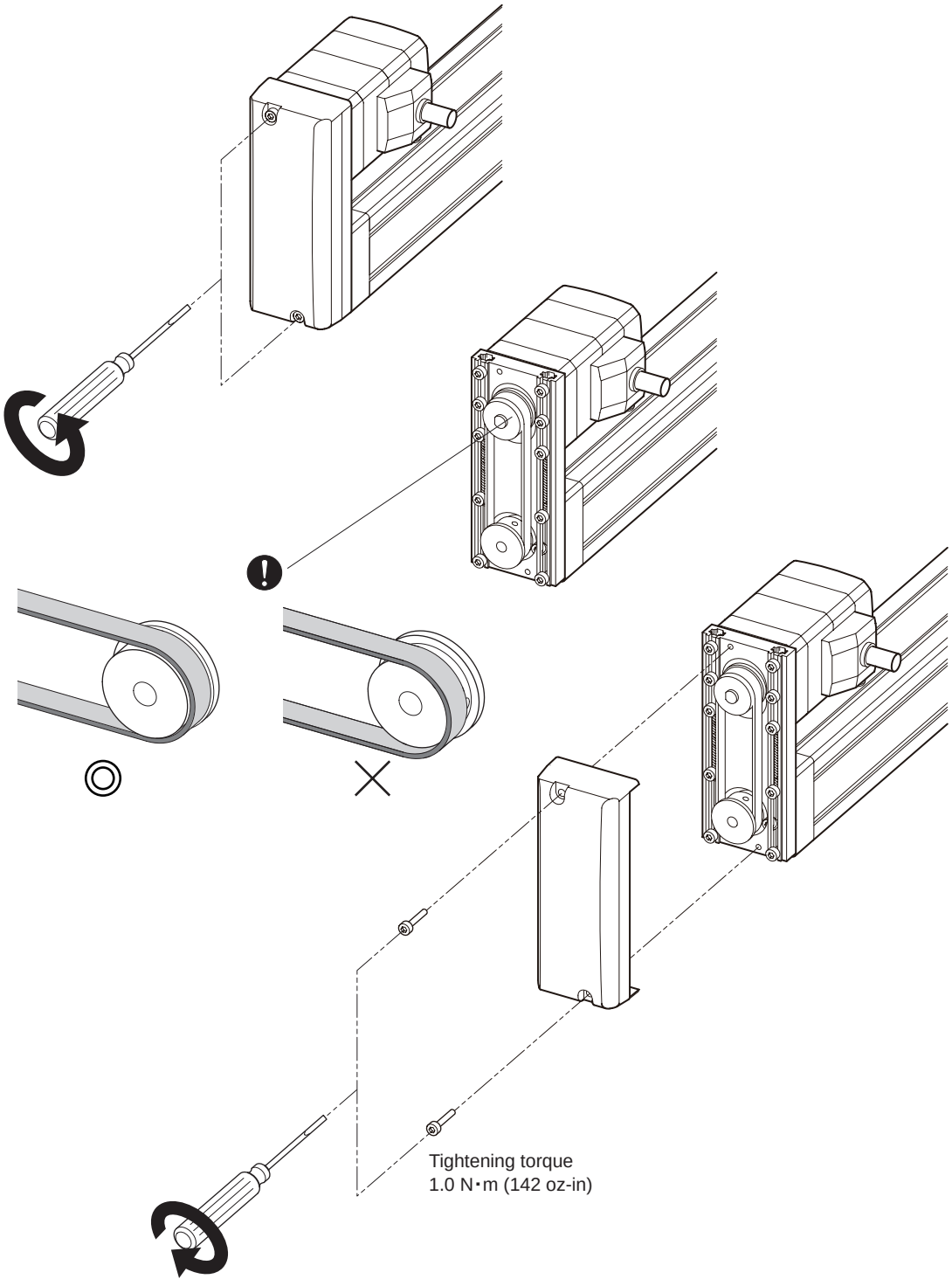
■ Checking the belt (when using the parallel motor mounting type)

Remove the pulley cover to check the belt condition.
Replace the belt if the following condition can be checked at the time of maintenance. See p.16 for how to replace the belt.

Note Remove the load and place the motorized linear slide horizontally before performing inspection and maintenance of belt.

Inspection interval	Every 500 km (310 mi.) in mileage
Inspection item	• Is there any crack on the belt rubber? • Is there any stripped teeth on the belt? • Is there any abnormal abrasion on facing fabric of the belt?

- How to remove and install the pulley cover



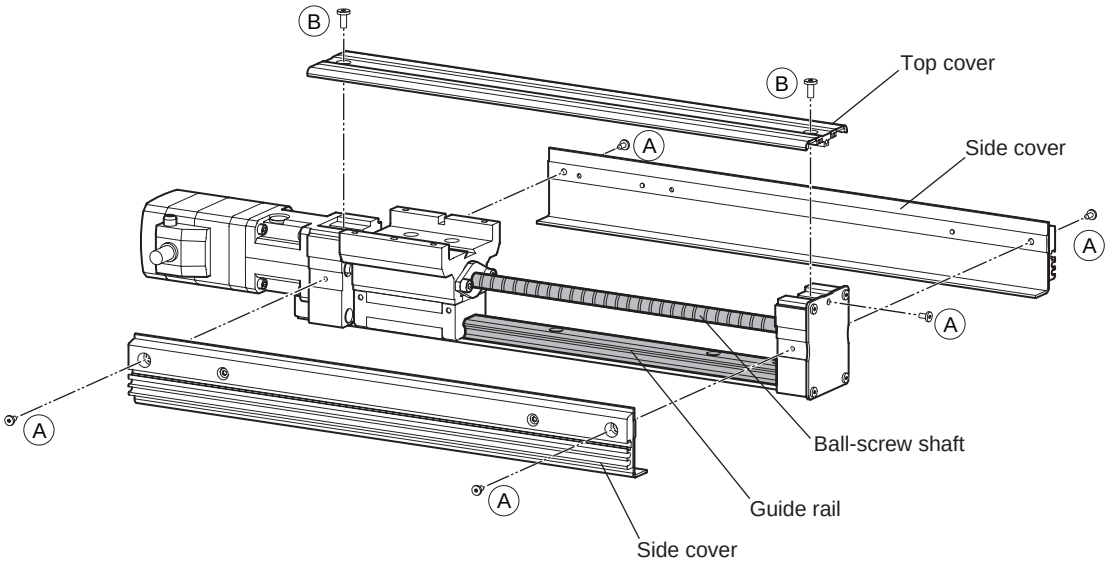
4.2 Greasing

Apply grease as an indication of the greasing timing in the table below.

	Greasing timing	Type of grease	Grease amount
Ball-screw shaft	• Every six months • Once every 100 km (62 mi) of travel • When grease becomes extremely dirty	AFF (THK CO., LTD.)	**EAS4** : 0.3 cm^3 (0.018 in^3) **EAS6** : 0.4 cm^3 (0.024 in^3)
Guide rail			**EAS4** : 0.7 cm^3 (0.043 in^3) **EAS6** : 1.5 cm^3 (0.092 in^3)

Note Wear protective goggles when applying grease. Pay attention to safety and handle the grease carefully by following the instructions provided with that product. If grease gets into the eyes or comes in contact with the skin, immediately flush the area thoroughly with water.

- How to remove the side cover and top cover



	Tightening torque
A	M3 0.6 N·m (85 oz-in)
B	M4 1.0 N·m (142 oz-in.)

4.3 Adjusting the belt tension and replacing the belt

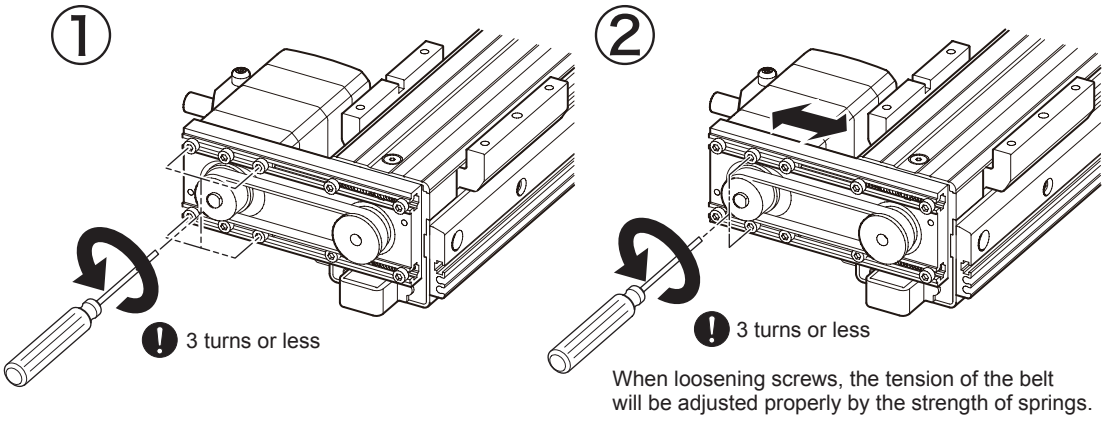
Note When performing tension adjustment or replacement of the belt, remove the load and keep the motorized linear slide in a horizontal position.

- Perform the belt tension adjustment in the order of ①→②→⑤→⑥
- Perform the belt replacement in the order of ①→②→③→④→⑤→⑥

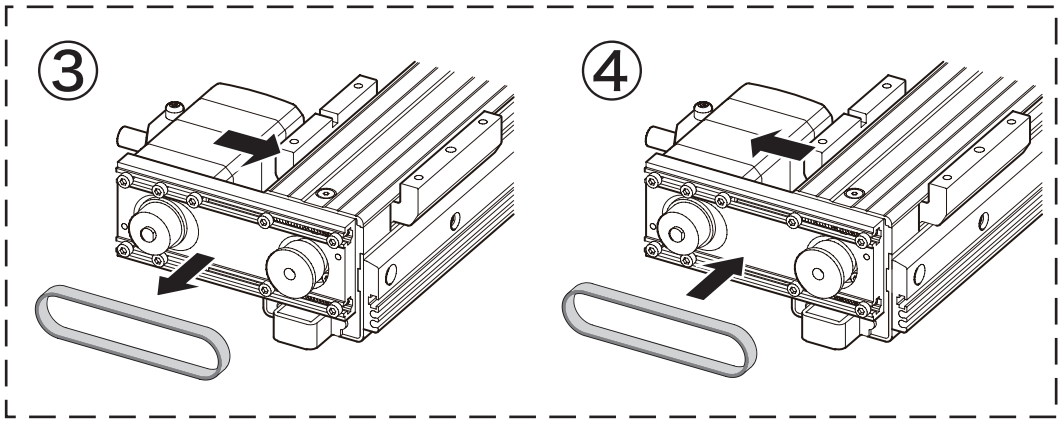
Use the following accessories (sold separately) for the belt replacement.

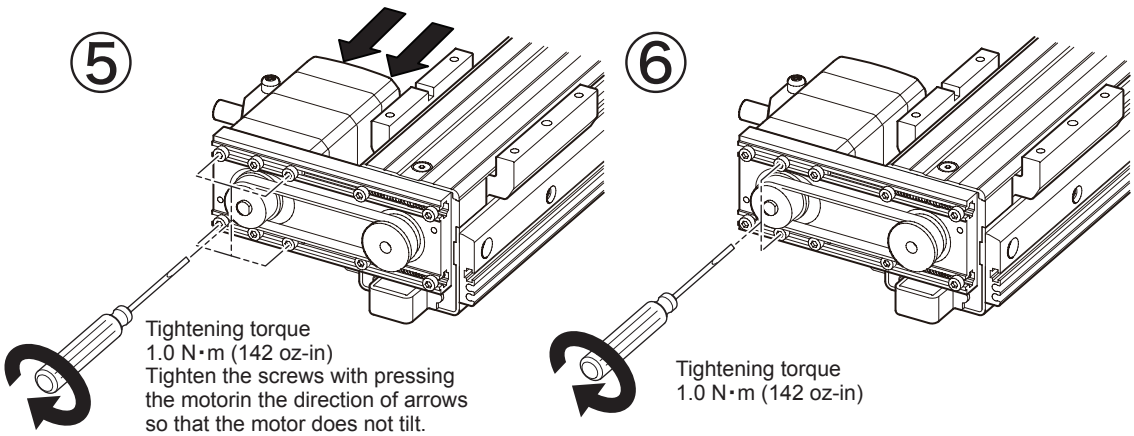
Motorized linear slide model	Belt model
EAS4	**LS-LVCS2M060186**
EAS6	**LS-LVCS3M080252**

EAS4



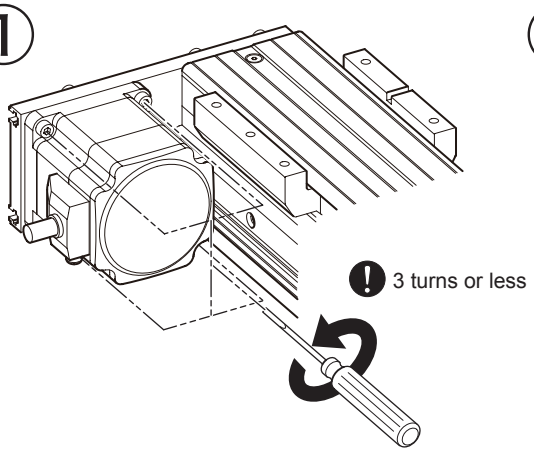
Replace the belt





EAS6

①



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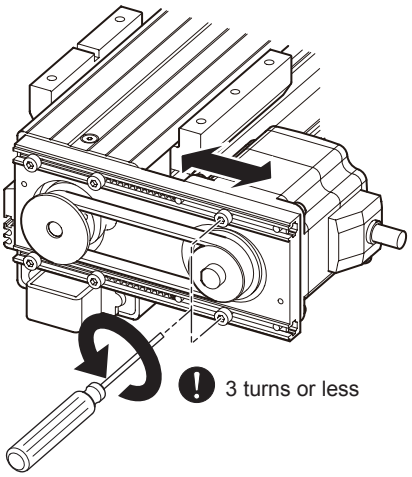
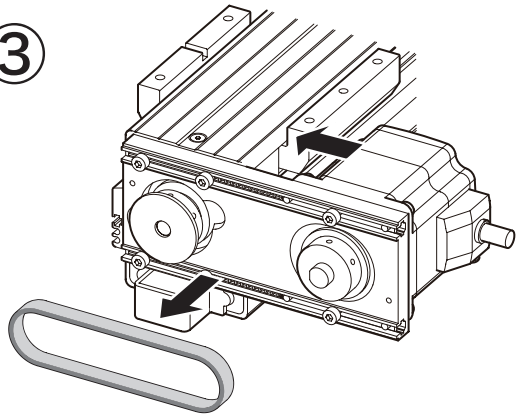


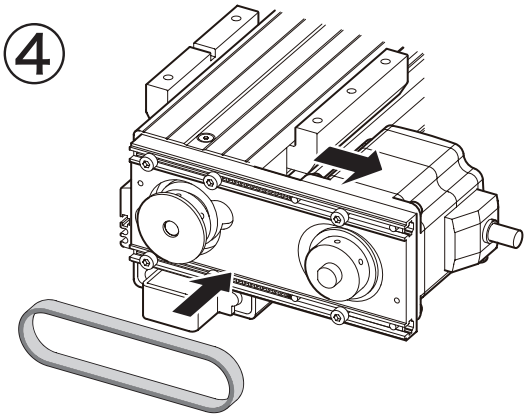
When loosening screws, the tension of the belt will be adjusted properly by the strength of springs.

Replace the belt

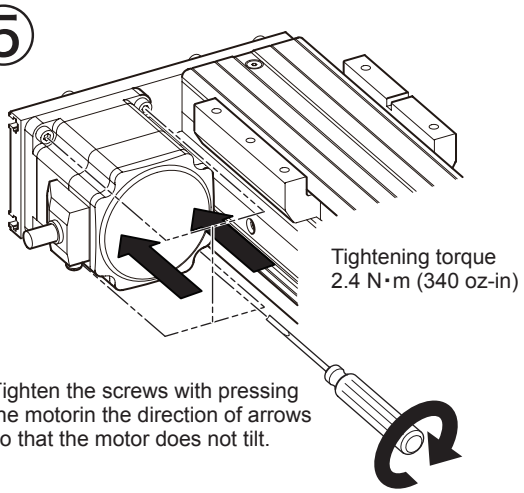
③



④

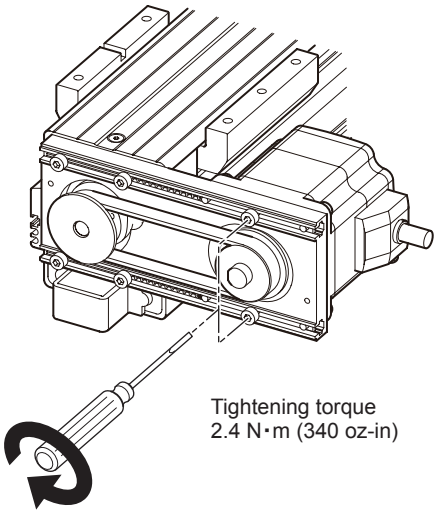


⑤



Tighten the screws with pressing the motorin the direction of arrows so that the motor does not tilt.

⑥



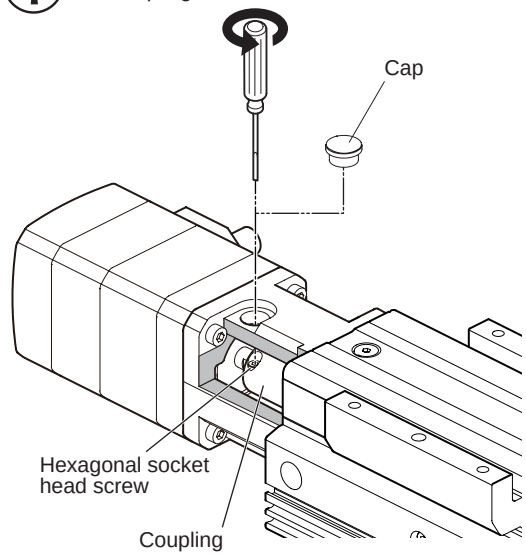
4.4 Replacing the motor

Note

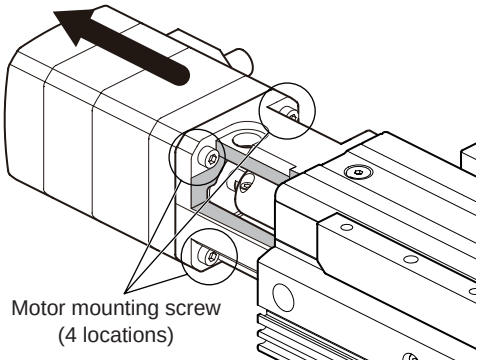
- When replacing the motor, remove the load and keep the motorized linear slide in a horizontal position.
- When using the parallel motor mounting type linear slide, use a new pulley. Contact your nearest Oriental Motor sales office for the pulley.

■ In-line motor mounting type

① Open the cap and loosen the screws of the coupling.



② Remove the motor by loosening the screws (4 locations) that are secured the motor.



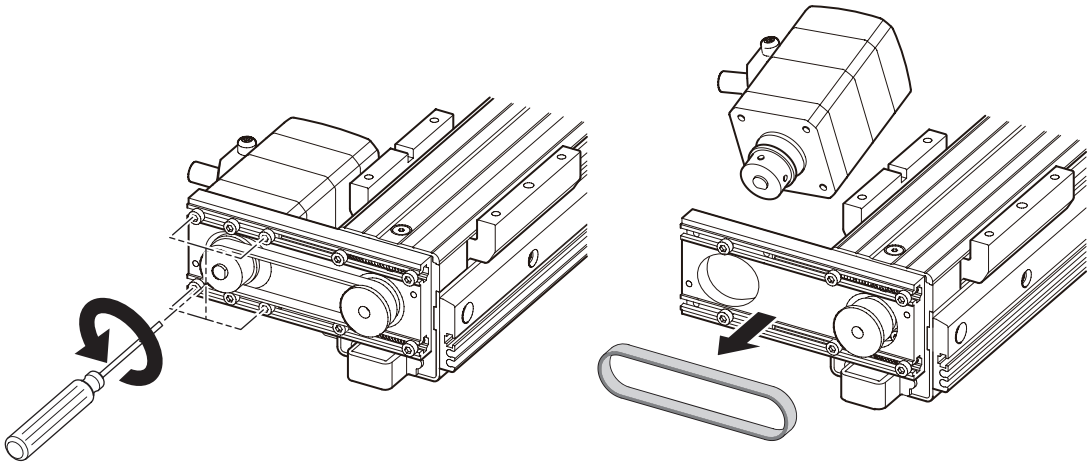
③ When installing the motor, perform the reverse procedure to removing the motor. (②→①)
Refer to p.7 "Changing the cable outlet direction of the motor" for the tightening torque of the motor mounting screw. Refer to the table below for the tightening torque of the coupling.

	Tightening torque
EAS4	M1.6 0.25 N·m (35 oz-in)
EAS6	M2.5 1.0 N·m (142 oz-in)

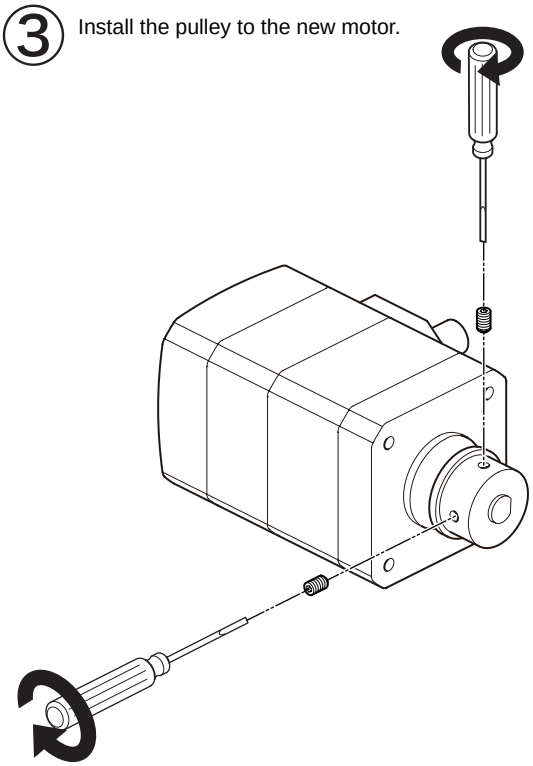
■ Parallel motor mounting type

① Remove the motor by loosening the screws (4 locations) that are secured the motor.

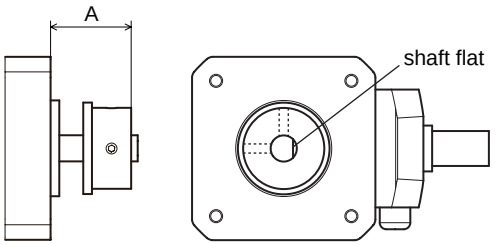
② When the motor is removed, the belt can be removed.



③ Install the pulley to the new motor.

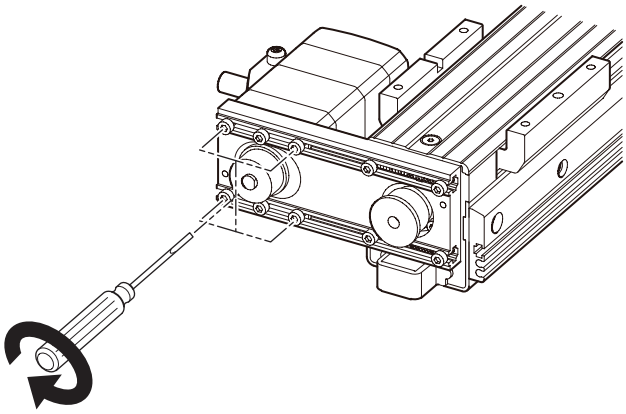


	A	Tightening torque
EAS4	18.5 mm (0.73 in)	M3 0.8 N･m (113 oz-in)
EAS6	20.5 mm (0.81 in)	M4 1.7 N･m (241 oz-in)



Fix the screw at the location other than the shaft flat on the motor shaft.

④ Tentatively mount the motor so that the motor can be shifted slightly. After tentatively attaching the motor, perform steps (②→④→⑤→⑥) according to p.16 "Adjusting the belt tension and replacing the belt."



5 Standard General specifications

5.1 Standard

■ Machinery Directive

The motorized actuators and drivers have been designed and manufactured to be incorporated in general industrial equipment, and a Declaration of Incorporation of Partly Completed Machinery is issued with them according to the Machinery Directive.

- Applicable standard: EN ISO 12100

■ Hazardous substances

The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).

5.2 General specifications

■ Installation conditions

The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment.

	EAS Series	
Power input	DC power supply	AC power supply
Over voltage category	Ⅱ	
Protection against electric shock	Class Ⅰ	
Pollution degree	2	3
Degree of protection	—	
Noise level	72 dB	

■ Environmental conditions

	Operation environment	Storage environment	Shipping environment
Ambient temperature	0 to +40 °C (+32 to +104 °F) (non-freezing)	−20 to +60 °C (−4 to +140 °F) (non-freezing)	
Humidity	85% or less (non-condensing)		
Altitude	Up to 1000 m (3300 ft.) above sea level	Up to 3000 m (10000 ft.) above sea level	Up to 3000 m (10000 ft.) above sea level

6 Before starting operation

6.1 Operation data setting for the motorized linear slide

When the minimum travel amount, travel amount, operating speed and acceleration/deceleration speed are set, the following calculation is required.

■ Minimum travel amount

The minimum travel amount can be changed using the driver switch or parameters (electronic gear A, electronic gear B).

$$\text{Minimum travel amount (mm)} = \frac{\text{Ball screw lead (mm)}}{\text{Motor resolution (P/R)}}$$

$$\text{Motor resolution (P/R)} = 1000 \times (\text{Electronic gear B} \div \text{Electronic gear A})$$

Setting example

When setting the minimum travel amount to 0.01 mm for 6 mm lead of the motorized linear slide

$$\text{Minimum travel amount (mm)} = \frac{6\ (\text{mm})}{\text{Motor resolution (P/R)}} = 0.01\ (\text{mm})$$

$$\text{Motor resolution (P/R)} = \frac{6\ (\text{mm})}{0.01\ (\text{mm})} = 600\ (\text{P/R})$$

$$\text{Motor resolution (P/R)} = 1000 \times (\text{Electronic gear B} \div \text{Electronic gear A}) = 600\ (\text{P/R})$$

$$\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{600}{1000} = \frac{3}{5}$$

When setting the minimum travel amount to 0.01 mm, set the electronic gear A to 5 and the electronic gear B to 3.

■ Travel amount

The travel amount is set by number of pulses.

Travel amount (mm) = Number of pulses (pulse) × Minimum travel amount (mm)

* Number of pulses: For the pulse input types only. It will be the position (step) for the built-in controller types.

Setting example

When the motorized linear slide which minimum travel amount is set to 0.01 mm is moved by 30 mm

Travel amount (mm) = Number of pulses (pulse) × 0.01 (mm) = 30 (mm)

$$\text{Number of pulses (pulse)} = \frac{30\ (\text{mm})}{0.01\ (\text{mm})} = 3000 \text{ pulse}$$

When moving the motorized linear slide by 30 mm, set 3000 pulses.

■ Operating speed

The operating speed is set by the pulse speed.

Operating speed (mm/s) = Pulse speed (Hz) × Minimum travel amount (mm)

* Pulse speed: For the pulse input types only. It will be the operating speed (Hz) for the built-in controller types.

Setting example

When the motorized linear slide which minimum travel amount is set to 0.01 mm is moved at the operating speed of 50 mm/s

Operating speed (mm/s) = Pulse speed (Hz) × 0.01 (mm) = 50 (mm/s)

$$\text{Pulse speed (Hz)} = \frac{50\ (\text{mm/s})}{0.01\ (\text{mm})} = 5000 \text{ Hz}$$

When moving the motorized linear slide at the operating speed of 50 mm/sec, set 5000 Hz.

■ Acceleration/deceleration speed

The acceleration/deceleration speed is set by any of the acceleration/deceleration rate (ms/kHz), acceleration/deceleration rate [ms/(1000 r/min)] or acceleration/deceleration time (sec).

$$\text{Acceleration/deceleration speed}\,(m/s^2) = \frac{\text{Minimum travel amount}\,(mm) \times 1000}{\text{Acceleration/deceleration rate}\,(ms/kHz)}$$

$$\text{Acceleration/deceleration speed}\,(m/s^2) = \frac{\text{Ball screw lead}\,(mm) \times 1000}{60 \times \text{Acceleration/deceleration rate}[ms/(1000\ r/min)]}$$

$$\text{Acceleration/deceleration speed}\,(m/s^2) = \frac{\text{Operating speed}\,(mm/s)}{\text{Acceleration/deceleration time}\,(sec)}$$

Setting example

When the motorized linear slide which minimum travel amount is set to 0.01 mm is moved at the acceleration/deceleration speed of 10 m/s^2

$$\text{Acceleration/deceleration speed}\,(m/s^2) = \frac{0.01\,(mm) \times 1000}{\text{Acceleration/deceleration rate}\,(ms/kHz)} = 10\,(m/s^2)$$

$$\text{Acceleration/deceleration rate}\,(ms/kHz) = \frac{0.01\,(mm) \times 1000}{10\ (m/s^2)} = 1\ ms/kHz$$

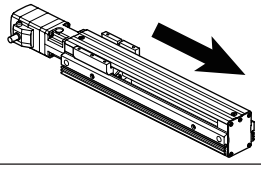
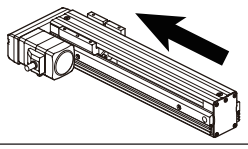
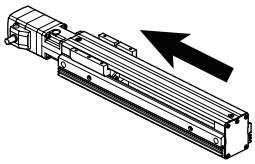
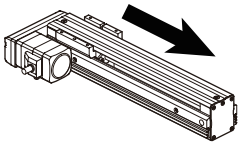
When moving the motorized linear slide at the acceleration/deceleration speed of 10 m/s^2, set 1 ms/kHz.

6.2 Moving direction of the table for the motorized linear slide

The moving direction of the table is set as follows at the time of shipment.

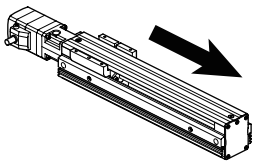
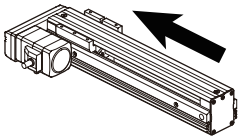
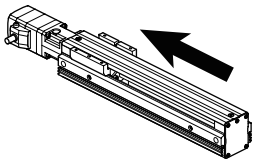
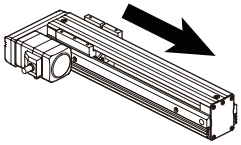
■ Built-in controller type

The moving direction varies depending on the setting of plus/minus of the travel amount.

	In-line motor mounting type	Parallel motor mounting type
When setting the travel amount to the plus side	The table moves to opposite the motor side 	The table moves to the motor side 
When setting the travel amount to the minus side	The table moves to the motor side 	The table moves to opposite the motor side 

■ Pulse input type

The moving direction varies depending on the input method of the pulse signal.

	In-line motor mounting type	Parallel motor mounting type
• 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is OFF	The table moves to opposite the motor side 	The table moves to the motor side 
• 2-pulse input mode When inputting the pulse signal to the CCW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON	The table moves to the motor side 	The table moves to opposite the motor side 

6.3 Data setter, data setting software

The minimum travel amount or operation data can be set using the accessory data setter **OPX-2A** (sold separately) or data setting software **MEXE02**. Provide as necessary.

■ Notes about using the data setter OPX-2A

In addition to setting operation data or parameters, the **OPX-2A** can save data that is set in the driver.
Data can be saved (uploaded) by a driver basis. The saved data can be written to drivers which model names are the same. Refer to the operating manual of the **OPX-2A** for details.

■ Notes about using the data setting software MEXE02

- When creating or editing data using the **MEXE02**, set data by selecting the series name of the equipped motor and driver model name.
- For the **EAS** Series, there are two types of driver to combine the actuator: One is the LSD drivers (driver model: LSD-○○) and the other is the ARD drivers (driver model: ARD-○○). When operation data and parameters are set using the **MEXE02**, select the following series in the product selection screen. If you have any questions, contact your nearest Oriental Motor sales office.

Driver	**MEXE02** version	Series to be selected
LSD driver	2.6	**DG Ⅱ / EAS**
	3.00 or later	**AR**
ARD driver	2.6	**AR**
	3.00 or later	**AR**

- Data can be saved by a driver basis. The saved data can be written to drivers which model names are the same.

6.4 Parameter setting list

■ For ARD-K, ARD-A, ARD-C and ARD-S

An example to set the minimum travel amount to 0.01 mm (0.0004 in.) is shown below.
 represents parameters to be changed.

Note
- Set the starting speed to 6 mm/s (0.24 in/s) or less.
- Set the operating speed by checking the specification of the maximum speed for each linear slide.
- Set the operating speed of JOG operation for test operation to 250 mm/s (9.84 in/s) or less.

• Lead: 6 mm (0.24 in.)

Setting items		Setting example		Initial value ∗1	
		Setting value	Converted value	Setting value	Converted value
Ball screw lead [mm (in.)]		6 (0.24)	–	6 (0.24)	–
Resolution { Minimum travel amount [mm (in.)] }		600 [0.01 (0.0004)]	–	1000 [0.006 (0.0002)]	–
Electronic gear	Electronic gear A1	5	–	10	–
	Electronic gear B	3	–	10	–
Operation setting	Motor rotation direction	Positive direction=CW (The linear slide table moves to opposite the motor side) ∗2	–	Positive direction=CW (The linear slide table moves to opposite the motor side) ∗2	–
Return to electrical home operation	Operating speed of return operation [r/min]	1000	100 [mm/s]	30	3 [mm/s]
			3.94 [in/s]		0.12 [in/s]
	Acceleration and deceleration rate of return operation [ms/(1000 r/min)]	50	2 [m/s^2]	100	1 [m/s^2]
			6.6 [ft/s^2]		3.3 [ft/s^2]
	Starting speed of return operation [r/min]	60	6 [mm/s]	30	3 [mm/s]
			0.24 [in/s]		0.12 [in/s]
Test operation	Operating speed of JOG operation [r/min]	1000	100 [mm/s]	30	3 [mm/s]
			3.94 [in/s]		0.12 [in/s]
	Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	50	2 [m/s^2]	100	1 [m/s^2]
			6.6 [ft/s^2]		3.3 [ft/s^2]
	Starting speed of JOG operation [r/min]	60	6 [mm/s]	30	3 [mm/s]
			0.24 [in/s]		0.12 [in/s]

*1 Factory setting data or initialized data.
*2 This is the table moving direction of the in-line motor mounting type. For the parallel motor mounting type, the table moves in the opposite direction of the in-line motor mounting type.

• Lead: 12 mm (0.47 in.)

Setting items		Setting example		Initial value ∗1	
		Setting value	Converted value	Setting value	Converted value
Ball screw lead [mm (in.)]		12 (0.47)	–	12 (0.47)	–
Resolution { Minimum travel amount [mm (in.)] }		1200 [0.01 (0.0004)]	–	1000 [0.012 (0.0005)]	–
Electronic gear	Electronic gear A1	5	–	10	–
	Electronic gear B	6	–	10	–
Operation setting	Motor rotation direction	Positive direction=CW (The linear slide table moves to opposite the motor side) ∗2	–	Positive direction=CW (The linear slide table moves to opposite the motor side) ∗2	–
Return to electrical home operation	Operating speed of return operation [r/min]	500	100 [mm/s]	30	6 [mm/s]
			3.94 [in/s]		0.24 [in/s]
	Acceleration and deceleration rate of return operation [ms/(1000 r/min)]	100	2 [m/s^2]	100	2 [m/s^2]
			6.6 [ft/s^2]		6.6 [ft/s^2]
	Starting speed of return operation [r/min]	30	6 [mm/s]	30	6 [mm/s]
			0.24 [in/s]		0.24 [in/s]
Test operation	Operating speed of JOG operation [r/min]	500	100 [mm/s]	30	6 [mm/s]
			3.94 [in/s]		0.24 [in/s]
	Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	100	2 [m/s^2]	100	2 [m/s^2]
			6.6 [ft/s^2]		6.6 [ft/s^2]
	Starting speed of JOG operation [r/min]	30	6 [mm/s]	30	6 [mm/s]
			0.24 [in/s]		0.24 [in/s]

*1 Factory setting data or initialized data.
*2 This is the table moving direction of the in-line motor mounting type. For the parallel motor mounting type, the table moves in the opposite direction of the in-line motor mounting type.

■ For ARD-KD, ARD-AD and ARD-CD

An example to set the minimum travel amount to 0.01 (0.0004 in.) mm is shown below.
represents parameters to be changed.

Note

- Set the starting speed to 6 mm/s (0.24 in/s) or less.
- Set the operating speed by checking the specification of the maximum speed for each linear slide.
- Set the operating speed of JOG operation for test operation to 250 mm/s (9.84 in/s) or less.
- When performing sensorless return-to-home operation upward in a vertical direction with the **EAS4** type, keep the load mass to be less than 4 kg (8.8 lb). If the load mass is 4 kg (8.8 lb) or more, the linear slide cannot push up to the position of the actuator end, causing variation in the stopping accuracy of return-to-home.
- For the travel amount of the "position offset of home-seeking," set the following value or larger.
  If sensorless return-to-home operation is performed keeping the initial values, the linear slide table becomes a state of contacting the dedicated stop buffer, causing a negative effect on the stopping accuracy of return-to-home.
  ・**EAS4**: 3 mm (0.12 in.) or more (setting value: 100, the table moves 300 steps from the actuator end)
  ・**EAS6**: 6 mm (0.24 in.) or more (setting value: 400, the table moves 600 steps from the actuator end)

- Lead：6 mm (0.24 in.)

Setting items			Setting example		Initial value ∗1	
			Setting value	Converted value	Setting value	Converted value
Ball screw lead [mm (in.)]			6 (0.24)		6 (0.24)	
Resolution { (Minimum travel amount [mm (in.)] }			600 [0.01 (0.0004)]		1000 [0.006 (0.0002)]	
Coordination	Electronic gear A		5	–	1	–
	Electronic gear B		3	–	1	–
	Motor rotation direction		Positive direction=CW (The linear slide table moves to opposite the motor side) ∗3	–	Positive direction=CW (The linear slide table moves to opposite the motor side) ∗3	–
Operation data	Position [step]		1000	10 [mm]	0	0 [mm]
				0.39 [in.]		0 [in.]
	Operating speed [Hz]		10000	100 [mm/s]	1000	6 [mm/s]
				3.94 [in/s]		0.24 [in/s]
	Acceleration (deceleration) rate [ms/kHz] ∗2		1	10 [m/s^2]	1	6 [m/s^2]
				32.8 [ft/s^2]		19.7 [ft/s^2]
Operation	JOG operating speed [Hz]		10000	100 [mm/s]	1000	6 [mm/s]
				3.94 [in/s]		0.24 [in/s]
	JOG acceleration (deceleration) rate [ms/kHz] ∗2		1	10 [m/s^2]	1	6 [m/s^2]
				32.8 [ft/s^2]		19.7 [ft/s^2]
	JOG starting speed [Hz]		600	6 [mm/s]	500	3 [mm/s]
				0.24 [in/s]		0.12 [in/s]
Return-to-home	Home-seeking mode		Push mode	–	3-sensor mode	–
	Starting speed of home-seeking [Hz]		2500	25 [mm/s]	500	3 [mm/s]
				0.98 [in/s]		0.12 [in/s]
	Position offset of home-seeking [step]	**EAS4**	100	1 [mm]	0	0 [mm]
				0.04 [in.]		0 [in.]
		EAS6	400	4 [mm]	0	0 [mm]
				0.16 [in.]		0 [in.]
	Starting direction of home-seeking		Negative direction (Return-to-home operation starts to the motor side) ∗3	–	Positive direction(Return-to-home operation starts to opposite the motor side) ∗3	–
Coordination	Positive software limit [step]		(Stroke× 100)+300	Stroke+3 [mm]	8388607	50331.642 [mm]
				Stroke+0.12 [in.]		1981.56 [in.]
	Negative software limit [step]		−200	−2 [mm]	−8388608	−50331.648 [mm]
				−0.08 [in.]		−1981.56 [in.]

*1 Factory setting data or initialized data.
*2 When setting the acceleration/deceleration rate via network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.
*3 This is the table moving direction of the in-line motor mounting type. For the parallel motor mounting type, the table moves in the opposite direction of the in-line motor mounting type.

• Lead : 12 mm (0.47 in.)

Setting items			Setting example		Initial value ∗1	
			Setting value	Converted value	Setting value	Converted value
Ball screw lead [mm (in.)]			12 (0.47)	–	12 (0.47)	–
Resolution { (Minimum travel amount [mm (in.)]) }			1200 [0.01 (0.0004)]	–	1000 [0.012 (0.0005)]	–
Coordination	Electronic gear A		5	–	1	–
	Electronic gear B		6	–	1	–
	Motor rotation direction		Positive direction=CW (The linear slide table moves to opposite the motor side) ∗3	–	Positive direction=CW (The linear slide table moves to opposite the motor side) ∗3	–
Operation data	Position [step]		1000	10 [mm]	0	0 [mm]
				0.39 [in.]		0 [in.]
	Operating speed [Hz]		10000	100 [mm/s]	1000	12 [mm/s]
				3.94 [in/s]		0.47 [in/s]
	Acceleration (deceleration) rate [ms/kHz] ∗2		1	10 [m/s^2]	1	12 [m/s^2]
				32.8 [ft/s^2]		39.4 [ft/s^2]
Operation	JOG operating speed [Hz]		10000	100 [mm/s]	1000	12 [mm/s]
				3.94 [in/s]		0.47 [in/s]
	JOG acceleration (deceleration) rate [ms/kHz] ∗2		1	10 [m/s^2]	1	12 [m/s^2]
				32.8 [ft/s^2]		39.4 [ft/s^2]
	JOG starting speed [Hz]		600	6 [mm/s]	500	6 [mm/s]
				0.24 [in/s]		0.24 [in/s]
Return-to-home	Home-seeking mode		Push mode	–	3-sensor mode	–
	Starting speed of home-seeking[Hz]		2500	25 [mm/s]	500	6 [mm/s]
				0.98 [in/s]		0.24 [in/s]
	Position offset of home-seeking [step]	**EAS4**	100	1 [mm]	0	0 [mm]
				0.04 [in.]		0 [in.]
		EAS6	400	4 [mm]	0	0 [mm]
				0.16 [in.]		0 [in.]
	Starting direction of home-seeking		Negative direction (Return-to-home operation starts to the motor side) ∗3	–	Positive direction (Return-to-home operation starts to opposite the motor side) ∗3	–
Coordination	Positive software limit [step]		(Stroke × 100)+300	Stroke+3 [mm]	8388607	100663.284 [mm]
				Stroke+0.12 [in.]		3963.12 [in.]
	Negative software limit [step]		−200	−2 [mm]	−8388608	−100663.296 [mm]
				−0.08 [in.]		−3963.12 [in.]

∗1 Factory setting data or initialized data.
∗2 When setting the acceleration/deceleration rate via network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.
∗3 This is the table moving direction of the in-line motor mounting type. For the parallel motor mounting type, the table moves in the opposite direction of the in-line motor mounting type.

6.5 Power supply current capacity

■ DC power input type

Model	Motorized Linear slide model	Driver			Power supply for releasing an electromagnetic brake
		Driver model	Power supply input voltage	Power supply current capacity	
EAS4○○-○○○○-**ARAK**-○	EASM4○○○○○○ARAK	ARD-K	24 VDC± 10% 48 VDC± 5%	1.4 A or more	–
EAS4○○-○○○○-**ARMK**-○	EASM4○○○○○○ARMK				24 VDC± 5% ∗ 0.1 A or more
EAS6○○-○○○○-**ARAK**-○	EASM6○○○○○○ARAK			3.1 A or more	–
EAS6○○-○○○○-**ARMK**-○	EASM6○○○○○○ARMK				24 VDC± 5% ∗ 0.3 A or more
EAS4○○-○○○○-**ARAKD**-○	EASM4○○○○○○ARAK	ARD-KD	24 VDC± 5% 48 VDC± 5%	1.8 A or more	–
EAS4○○-○○○○-**ARMKD**-○	EASM4○○○○○○ARMK				–
EAS6○○-○○○○-**ARAKD**-○	EASM6○○○○○○ARAK			3.8 A or more	–
EAS6○○-○○○○-**ARMKD**-○	EASM6○○○○○○ARMK				–

∗ If the distance between the motorized linear slide and driver is extended to 20 m (65.6 ft.) or longer, use a power supply of 24 VDC± 4%.

■ AC power input type

Model	Motorized Linear slide model	Driver				Control power supply
		Driver model	Power supply input voltage	Frequency	Power supply current capacity	
EAS4○○-○○○○-**ARAA**-○	EASM4○○○○○○ARAC	ARD-A	Single-Phase 100-115 VAC	50/60 Hz	2.9 A or more	24 VDC± 5% ∗1 ∗3 0.75 A or more
EAS4○○-○○○○-**ARMA**-○	EASM4○○○○○○ARMC					
EAS6○○-○○○○-**ARAA**-○	EASM6○○○○○○ARAC				4.4 A or more	
EAS6○○-○○○○-**ARMA**-○	EASM6○○○○○○ARMC					
EAS4○○-○○○○-**ARAC**-○	EASM4○○○○○○ARAC	ARD-C	Single-Phase 200-230 VAC		1.9 A or more	
EAS4○○-○○○○-**ARMC**-○	EASM4○○○○○○ARMC					
EAS6○○-○○○○-**ARAC**-○	EASM6○○○○○○ARAC				2.7 A or more	
EAS6○○-○○○○-**ARMC**-○	EASM6○○○○○○ARMC					
EAS4○○-○○○○-**ARAS**-○	EASM4○○○○○○ARAC	ARD-S	Three-Phase 200-230 VAC		1.0 A or more	
EAS4○○-○○○○-**ARMS**-○	EASM4○○○○○○ARMC					
EAS6○○-○○○○-**ARAS**-○	EASM6○○○○○○ARAC				1.4 A or more	
EAS6○○-○○○○-**ARMS**-○	EASM6○○○○○○ARMC					
EAS4○○-○○○○-**ARAAD**-○	EASM4○○○○○○ARAC	ARD-AD	Single-Phase 100-120 VAC		2.4 A or more	24 VDC± 5% ∗2 ∗3 0.5 A or more
EAS4○○-○○○○-**ARMAD**-○	EASM4○○○○○○ARMC					
EAS6○○-○○○○-**ARAAD**-○	EASM6○○○○○○ARAC				3.6 A or more	
EAS6○○-○○○○-**ARMAD**-○	EASM6○○○○○○ARMC					
EAS4○○-○○○○-**ARACD**-○	EASM4○○○○○○ARAC	ARD-CD	Single-Phase 200-240 VAC		1.5 A or more	
EAS4○○-○○○○-**ARMCD**-○	EASM4○○○○○○ARMC					
EAS6○○-○○○○-**ARACD**-○	EASM6○○○○○○ARAC				2.3 A or more	
EAS6○○-○○○○-**ARMCD**-○	EASM6○○○○○○ARMC					

*1 If a motorized linear slide with an electromagnetic brake is used, be sure to connect a 24 VDC power supply as the electromagnetic brake power.

*2 The 24 VDC power supply is for control circuit. Be sure to connect it.

*3 If the distance between the linear slide with an electromagnetic brake and driver is extended to 20 m (65.6 ft.) or longer, use a power supply of 24 VDC± 4%.

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